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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HAM, SEUNGSOOK

ART UNIT PAPER NUMBER

2817

DATE MAILED: 06/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/838,483

Applicant(s)

SENGUPTA ET AL.

Examiner

Seungsook Ham

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, and 4-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 13 and 15 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 1 is limited to a "barium strontium titanate (BSTO) composite". However, claims 13 and 15 do not further limit the BSTO composite rather recite different materials.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, and 4-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 1, lines 6 and 7, "effective phase tuning at non-chilled temperatures" is not described nor support in the original specification to understand what would be considered as "effective phase tuning" and "non-chilled temperatures". Thus, such limitation is considered as new matter.

Art Unit: 2817

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, and 4-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, "effective phase tuning" and "non-chilled temperatures" are vague and indefinite as to what characteristic would consider as "effective", and what temperature range would consider as "non-chilled temperatures".

Claims 14-15 are vague and indefinite as how these materials are related to "barium strontium titanate (BSTO) composite" recited in claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 4, 5 and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vandik et al. ("Ferroelectric Tuning of Planar and Bulk Microwave Devices") in view of Wolfson et al. (US '104) or Sengupta et al. (US '697).

Vandik et al. (fig. 14) discloses a tunable finline phase shifter comprising: a waveguide (p. 333, section 6), a finline substrate, a tunable dielectric layer (ferroelectric material/BSTO) and first and second conductors positioned on the tunable dielectric layer and separated to form a gap s. Vandik et al. is silent as to the specific range for the gap s. However, Vandik et al. teaches that the gap/slot provides capacitance (see page 333-34, sec. 6.1) which is the same concept as the applicant's invention (see spec. page 5, lines 8-11). Moreover, the applicant does not provide any criticality of such range in the disclosure.

Therefore, it would have been obvious to one of ordinary skill in the art to provide the gap having a minimum width ranging from 2 micron to 50 micron in the device of Vandik et al. to provide a desired capacitance coupling since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955), also *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Furthermore, Vandik et al. is unclear as to whether the ferroelectric material/BSTO has a characteristic of low insertion loss and effective phase tuning at non-chilled temperatures, including room temperatures. However, Vandik et al. does

address the problem of using ferroelectric material such as BSTO in a room temperature (e.g., see p. 336, Table IV).

Wolfson et al. discloses a microwave phase shifter using ferroelectric material/BSTO in a room temperature (see figs. 5-7).

Sengupta et al. also discloses a ferroelectric material/BSTO composite using in a phase shifter (col. 4, lines 16-20) at room temperature/non-chilled temperatures that provides a low loss and high tunability (col. 3).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to use ferroelectric material/BSTO composite of Wolfson et al. or Sengupta et al. that operates at room temperature/non-chilled temperature in the device of Vandik et al. to obtain low loss and high tunability as taught by Wolfson et al. (col. 7, line 60 – col. 8, line 13) or Sengupta et al. (col. 3)

Regarding claim 4, it is inherent that a voltage source is applied to the first and second conductor to tune the phase shift (p. 334, section 6.2)

Regarding claim 13, Vandik et al. teaches the ferroelectric material can be composed of BSTO (p. 327, section 3.2).

Regarding to claim 5, forming the second conductor as RF ground is an obvious modification since one conductor should be grounded in order to function as a phase shifter using a tunable dielectric layer.

Regarding claims 14-18, it would have been obvious to use the materials recited in these claims in the device of Vandik et al. since they are well known ferroelectric material (see Sengupta et al., BSTO-MgO).

Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vandik et al. ("Ferroelectric Tuning of Planar and Bulk Microwave Devices") in view of Wolfson et al. (US '104) or Sengupta et al. (US '697) as applied to claim 1 above, and further in view of Conti (US '654).

Regarding claim 2, the modified device of Vandik et al. does not show the gap having exponentially tapered portions adjacent to the first and the second ends. However, it should be noted that Vandik et al. shows the gap having stepped portions at the ends (see fig. 15) for impedance matching. Thus, it would have been obvious to one of ordinary skill in the art to provide the gap having exponentially tapered portions at the ends in the modified device of Vandik et al. for impedance matching since such design technique is well known in the art.

Regarding to claim 6, providing an RF choke in a phase shifter is well known in the art as shown by Conti (fig. 5, RF choke patches 82). Thus, it would have been obvious to provide an RF choke in the modified device of Vandik et al. to suppress high RF signals.

Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vandik et al. ("Ferroelectric Tuning of Planar and Bulk Microwave Devices") in view of Wolfson et al. (US '104) or Sengupta et al. (US '697) as applied to claim 1 above, and further in view of Bates (EP '393).

The modified device of Vandik et al. does not show a first conductive plate/conductor being insulated from the waveguide and a second conductive plate/conductor being electrically connected to the waveguide. However, such finline

structure is well known in the art. Bates (fig. 2) discloses a finline structure having a first conductive plate/conductor 4 being insulated from the waveguide 8, 9 and a second conductive plate/conductor 5 being electrically connected to the waveguide. Therefore, it would have been obvious to one of ordinary skill in the art to provide a first conductive plate/conductor being insulated from the waveguide and a second conductive plate/conductor being electrically connected to the waveguide in the modified device of Vandik et al. to couple the first conductive plate/conductor to the waveguide at microwave frequencies but isolated at lower frequencies (p. 4, lines 9-25).

Regarding claims 8, 9, 11 and 12, it would have been obvious to provide exponentially tapered gap between the first and second conductive plates in the modified device of Vandik et al. for impedance matching as shown by Bates (see fig. 1).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seungsook Ham whose telephone number is (703) 308-4090. The examiner can normally be reached on Monday - Thursday from 8:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Pascal can be reached on (703) 308-4909. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Art Unit: 2817

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Seungsook Ham
Primary Examiner
Art Unit 2817

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June 17, 2003